

California Department of Pesticide Regulation
Environmental Monitoring Branch
1001 I Street, Sacramento CA 95814-2828
P.O. Box 4015, Sacramento CA 95812-4015

SOP Number: FSOT.002.00
Previous SOP: None
Page 1 of 3

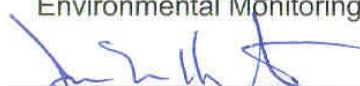
STANDARD OPERATING PROCEDURE
Instructions for the Calibration and Use of a Spherical Densiometer

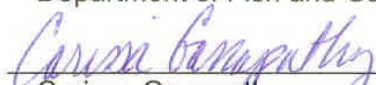
KEY WORDS

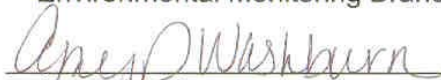
Physical habitat assessment, Canopy density, Overstory density, Shade

APPROVALS

APPROVED BY:  DATE: 5/19/03
Kean S. Goh
Environmental Monitoring Branch Management

APPROVED BY:  DATE: 4/25/03
James M. Harrington,
Department of Fish and Game Senior Scientist

APPROVED BY:  DATE: 4/27/03
Carissa Ganapathy
Environmental Monitoring Branch Quality Assurance Officer

PREPARED BY:  DATE: 4/29/03
Amy Washburn
Scientific Aide

Environmental Monitoring Branch organization and personnel, such as management, senior scientist, quality assurance officer, project leader, etc., are defined and discussed in SOP ADMN002.

STANDARD OPERATING PROCEDURE

Instructions for the Calibration and Use of a Spherical Densiometer

1.0 INTRODUCTION

The physical habitat conditions of a stream are assessed when determining the integrity of a wadeable stream. Estimation of a canopy cover contributes to the assessment. A densiometer is used to measure the amount of surface water that is covered by shade from streamside vegetation.

1.1 Purpose

This Standard Operating Procedure (SOP) describes the method to quantify canopy density using a spherical densiometer.

1.2 Definitions

1.2.1 Canopy density- the thickness and consistency of plant foliage

1.2.2 Overstory- the overhead foliage

1.2.3 Transects- a mark or line cut across the stream, representing the measuring point

1.2.4 Sampling point – a selected riffle or transect from which to collect the sample and also collect physical habitat data

2.0 MATERIALS

2.1 Spherical densiometer



3.0 PROCEDURES

The methodology described in this document was modified from the Forest Densiometer Instruction Sheet.

3.1 Choosing Sites

3.1.1 Follow procedures described in SOP FSWA013.00 or the project protocol to determine the sampling point at which to take densiometer measurements (site determination, riffle or transect location, ect.).

STANDARD OPERATING PROCEDURE

Instructions for the Calibration and Use of a Spherical Densiometer

- 3.1.2 Take a densiometer reading at mid-channel, left and right bank and average the three points. Do this for each selected riffle or transect.
- 3.1.3 Facing up stream, hold the instrument level (indicated by the round level in the lower left hand corner). Hold the densiometer far enough away from your body so that your head is just outside the grid (12-18" away).
- 3.1.3 There are a total of 24, 1/8" x 1/8" squares in the grid. Each square represents an area of canopy opening (sky image or unfilled squares) or canopy cover (vegetation image or filled squares). Count the number of canopy opening squares. If there are squares that are only partially filled, these can be added to make a complete square.
- 3.1.4 The uncovered area is determined by multiplying the number of squares by 4.17. Subtract this number from 100% to determine overstory density in %.

e.g.: $100\% - (10 \text{ unfilled squares} \times 4.17) = 58.3\% \text{ overstory density}$
- 3.1.5 If more than half of the canopy area is open sky the counting process can be reversed. Count the filled square areas that are covered by the canopy. Multiply by 4.17 to obtain the estimated overstory density directly in percent.

i.e.: $\text{Number of filled squares} \times 4.17 = \% \text{ overstory density}$

4.0 SPHERICAL DENSIOMETER STORAGE

The spherical densiometer is designed for rugged field use. To store, close the lid and securely fasten the clasp.

5.0 CLEANING THE DENSIOMETER

Clean the face of the densiometer by dusting with a soft cloth.

STANDARD OPERATING PROCEDURE

Instructions for the Calibration and Use of a Spherical Densiometer

6.0 REFERENCES

Forest Densiometer Instruction Sheet
Robert E. Lemmon, FOREST DENSIOMETERS
5733 SE Cornell Dr.
Bartlesville, OK 74006
(918) 333-2830